

REMARKS

In the Office Action mailed on November 30, 2004, the Examiner rejected claims 17 – 54. With this Amendment, Applicant has amended claim 19 and canceled claims 18, 23, 32, 35, 36, and 40 – 54. The application now includes claims 17, 19 – 22, 24 – 31, 33, 34, and 37 – 39.

The Applicant hereby encloses a Petition for One-Month Extension of Time with a Credit Card Payment Form in the amount of \$ 65.00.

SPECIFICATION

The Examiner objected to the abstract of the disclosure because it contains legal terms such as comprising. In accordance with the Examiner's directions, Applicant has amended the abstract of the disclosure. Therefore, it is respectfully requested that the objection to the abstract of the disclosure be withdrawn.

In addition, the Examiner objected to the specification as failing to provide proper antecedent basis for the claimed subject matter. He stated that there is no support for the claimed subject matters in claims 27, 28, 32, 35 – 38, and 40 – 54. With this Amendment, Applicant has canceled claims 32, 35, 36, and 40 – 54. Concerning claims 19, 27, 28, 37, and 38, however, these claims are supported within the originally filed specification. In particular, claims 19, 27, 28, 37, and 38 concern cooperative sensors and how they are used which is set forth in the specification, page 5, lines 3 – 14. Therefore, it is respectfully requested that the objection to the specification be withdrawn.

Furthermore, the Examiner has commented that the specification is incomplete in that the specification ends on page 5. The original specification was six pages and all pages were included with the original filing on September 30, 2003. A complete and true copy of the specification, pages 1 – 5, as filed, is enclosed herewith.

REJECTION OF CLAIMS UNDER 35 U.S.C. § 112

First paragraph

The Examiner rejected claims 19, 24, 27, 28, 32, 35 – 38 and 40 – 54 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. The Examiner asserts that the claims contain subject matter which was not described in the specification in such

a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Concerning claim 19, the Examiner stated that it is not understood what resonant deformation of the columns means. Applicant has amended claim 19 to better define the present invention.

Concerning claim 24, the Examiner asked how does the system reduce vacuum pressure at local points on the wing and changing the coefficient of lift. Applicant directs the Examiner's attention to the specification, page 4, lines 26 – 29.

Concerning claims 27, 28, 37, and 38, Applicant directs the Examiner's attention to the discussion above.

Concerning claims 32, 35, 36, and 40 – 54, these claims have been canceled.

Therefore, in light of the above, it is respectfully requested that the rejection of claims 19, 24, 27, 28, 32, 35 – 38 and 40 – 54 under 35 U.S.C. § 112, first paragraph, be withdrawn and that claims 19, 24, 27, 28, 37, 38 be held allowable.

Second paragraph

The Examiner rejected claims 19 and 42 under 35 U.S.C. § 112, second paragraph, as being indefinite. With this Amendment, Applicant has amended claim 19 in accordance with the Examiner's directions and canceled claim 42. Therefore, it is respectfully requested that the rejection of claims 19 and 42 under 35 U.S.C. § 112, second paragraph, be withdrawn and that claim 19 be held allowable.

REJECTION OF CLAIMS UNDER 35 U.S.C. § 102 and § 103

Claims 17, 19, 26, 29 – 37, and 39 - 48

In the Office Action, the Examiner rejected claims 17, 19, 26, 29 – 37, and 39 – 48 under 35 U.S.C. § 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over the Wygnanski patent. Applicant respectfully disagrees.

The Wygnanski patent describes the use of periodic actuation for separation control on wings and diffusers. The purpose of the actuators in the Wygnanski patent is to introduce instabilities into the flow that excite structures in the separated shear layer entraining high-energy fluid from the free stream, reenergizing the boundary layer, and reattaching it to the surface. The

effectiveness of this technique is limited to angles of attack where separation occurs.

Furthermore, the method described in the Wygnanski patent also excites the flow structures at specific frequencies related to the favored instability of this flow.

In contrast, the present invention as claimed in the present application affects the lift locally on the airfoil by creating separated regions and vortices modifying the pressure locally and, thus, affecting the lift and moment coefficients. The frequency of actuation is at frequencies that produce either separation or vortical structures (or both) and is different from that described in the Wygnanski patent.

Furthermore, the Wygnanski patent forces at a prescribed frequency at which the flow will be receptive to disturbance thus causing enhanced entrainment of the higher energy flow above the wing to prevent separation. The Wygnanski patent does not describe lift control below separation as claimed in the present application. The present application specifically claims efficient resonant actuators and control of lift through local separation and vortex generation.

Since the Wygnanski patent neither teaches nor describes the present invention as claimed, it is respectfully requested that the rejection of claims 17, 19, 26, 29 – 37, and 39 – 48 under 35 U.S.C. § 102(b) and § 103(a) be withdrawn and that claims 17, 19, 26, 29 – 31, 33, 34, 37, and 39 be held allowable.

Claims 18 and 20 – 25

The Examiner rejected claims 18 and 20 – 25 under 35 U.S.C. § 103(a) as being unpatentable over the Wygnanski patent in view of the Neff patent. Applicant respectfully disagrees.

The Wygnanski patent vaguely describes the actuators used, but never describes a resonant actuator as claimed in the present application. The resonant fence actuator of the present application has inherent efficiency in the movement produced in a resonating device. While the Neff patent describes the use of a voice coil. The voice coil of the present application is merely a means of producing the movement that excites the resonance.

Since neither the Wygnanski patent nor the Neff patent either teaches or describes the present invention as claimed, it is respectfully requested that the rejection of claims 18 and 20 - 25 under 35 U.S.C. § 103(a) be withdrawn and that claims 21, 22, 24, and 25 be held allowable.

Claims 27, 28, 38, and 49 - 54

The Examiner rejected claims 27, 28, 38, and 49 – 54 under 35 U.S.C. § 103(a) as being unpatentable over the Wygnanski patent in view of the Lurz patent. Applicant respectfully disagrees.

Although the Wygnanski patent describes actuators and the Lurz patent considers multiple, independent actuators, neither suggests the use of a second (or third or fourth or ...) actuator to enhance or suppress the disturbance produced by the first. The claims of the present application claim producing flow structures (presumably vortices) that convect in the direction of the flow and are either enhanced or suppressed by other actuators. The Lurz patent's description of the use of multiple actuators is very vague and provides no specifics on the types of disturbances created or exactly what they would do. There is also no mention in the Lurz patent of coordination of these independent actuators; rather they all seem to be operating independently.

In addition, the Lurz patent proposes a sensor/actuator system without being specific as to how the actuator causes the change in the flow. There is also no specific effect discussed. While open and closed loop control of disturbances is mentioned without any specificity, it is difficult for a person skilled in the art to understand how this would work.

Since neither the Wygnanski patent nor the Lurz patent either teaches or describes the present invention as claimed, it is respectfully requested that the rejection of claims 27, 28, 38, and 49 – 54 under 35 U.S.C. § 103(a) be withdrawn and that claims 27, 28, and 38 be held allowable.

CONCLUSION

It is believed that the present application is in condition for examination and allowance. Consideration and allowance of the present application is respectfully requested.

Respectfully submitted,
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